her usual haunt. One of her progeny some years after showed a similar liking for solitude; he was placed among several other horses (many of them he had known for years) on a small run intersected with bushy gullies, more or less rocky. He was soon missing, and search was made for him for some time without success; he was supposed to have come to grief in the bush; at length he was found, most unexpectedly, on a small patch of pasture between two rocky gullies thickly bushed; this spot was so difficult of access that a slight track had to be cut to get the horse back. Having been brought from a large station where he was bred and reared, he no longer enjoyed a great range by which he could place any long distance between his companions and himself; he displayed much tact and judgment in the way he secured the indulgence of hereditary habit, by discovering and reaching with difficulty an almost inaccessible solitude. One of the best and fleetest stock mares for the fast and hard work of "cutting out"[1] was a beautiful creature notorious as an incorrigible kicker; she has most faithfully transmitted this vice to her offspring.

Peculiarity in the formation of the hoof has been handed down to descent after descent by a grand old mare who had this blemish as a slight counterpoise perhaps to her many virtues.

A particular strain of Dorking fowls, which I have had for thirty years or so, always shows a restless desire for rambling, and that too under the difficulty of meeting with much persecution when straying beyond their ample range. This special family always exhibits what may be termed the gift of locality.

Ohinitahi, N.Z. THOMAS H. POTTS

Moon-Stroke

THERE is a popular belief that it is dangerous to sleep in full moonshine, as it is supposed to produce some injurious effect called moon-stroke. I have little doubt that the popular belief is well founded as far as the injury to some of those who have slept out at night is concerned, especially in full moonshine; nevertheless the injury is not, I think, due to the moon, but to another cause, which I shall here attempt to explain. It has often been observed that when the moon is full, or near its full time, there are rarely any clouds about, and if there be clouds before the full moon rises they are soon dissipated, and therefore a perfectly clear sky, with a bright full moon, is frequently observed.

A clear sky admits of rapid radiation of heat from the surface of the earth, and any person exposed to such radiation is sure to be chilled by rapid loss of heat. There is reason to believe that, under the circumstances, paralysis of one side of the face is sometimes likely to occur from chill, as one side of the face is more likely to be exposed to rapid radiation, and consequent loss of its heat. This chill is more likely to occur when the sky is perfectly clear.

I have often slept in the open in India on a clear summer night, when there was no moon, and although the first part of the night may have been hot, yet, towards 2 or 3 o'clock in the morning, the chill has been so great that I have often been awakened by an ache in my forehead, which I as often have counteracted by wrapping a handkerchief round my head and drawing the blanket over my face. As the chill is likely to be greatest on a very clear night, and the clearest nights are likely to be those on which there is a bright moonshine, it is very possible that neuralgia, paralysis, or other similar injury, caused by sleeping in the open, has been attributed to the moon, when the proximate cause may really have been the *chill*, and the moon only a remote cause acting by dissipating the clouds and haze (if it do so), and leaving a perfectly clear sky for the play of radiation into space. E. BONAVIA

Lucknow, August 26

The Memoirs of the Geological Survey

I DESIRE through the medium of your columns to call attention to the fact that most of the admirable memoirs of the Geological Survey appear to be out of print. A week or two ago I ordered a number of these publications and was informed that at least half of them are out of print. Prof. Ramsay's "Geology of North Wales" is in this category and the fact is stated in the printed list, but in a letter recently received from the professor he informs me that the work is being reprinted, and is expected to be published about the middle of next year. Without, in the absence of information, desiring to attach blame to any one, I shall be glad to know the reason why works admittedly of the highest value should have been permitted to fall into such apparent neglect. WM. HORSFALL

Manchester, October 9

OUR ASTRONOMICAL COLUMN

CHACORNAC'S VARIABLE NEBULA NEAR ζ TAURI.—On October 19, 1855, Chacornac remarked that a star of the eleventh magnitude, north-preceding ζ Tauri, was enveloped in nebulosity, which was sufficiently bright up to the end of January following to occasion surprise that it had not been previously detected. The star had been repeatedly observed in 1854.

Chacornac gives the position of the star upon which the nebula was projected for 1852·0 in R.A. 5h. 28m., 35·6 N.P.D. 68° 52′ 42″. The form of the nebula was nearly rectangular, the longest side subtending an arc of 3½′ and the shorter, one of 2½′. The star occurs in the zone observed at Markree, January 16, 1850, without mention of surrounding nebulosity.

On September 12, 1863, and January 25, 1865, D'Arrest observed the star with the Copenhagen refractor, on the last occasion "cœlo valde eximio," without being able to detect any trace of the nebula. He estimated the star 11·12 m., and noticed another 13 m., about 40″ preceding nearly on the parallel.

From Chacornac's position for 1852, it appears the star precedes ζ Tauri 12·5s., and is N. 4′ 28″. It may be recommended for examination during the approaching winter, particularly with telescopes of moderate dimensions, which in the case of another suspected variable nebula (Schönfeld, 1858) have been shown to possess decided advantage over the larger instruments.

OLBER'S SUPPOSED VARIABLE IN VIRGO.—Mr. Tebbutt of Windsor, N.S.W., communicates the results of some observations of this object and neighbouring stars, made in July and August of the present year. For 1876·0 he found:—

Star.	Magnitude.	R.A.			N.P.D.		
		h.	m.	s.	°	′	″
1	7	13	3	7·7	105	51	12
2	9½	13	5	17·6	105	51	15
3	8½	13	7	32·4	105	53	50
4	9	13	9	12·9	105	37	1

No. 3 is the supposed variable. See this column, 1876, April 13.

RELATIVE BRIGHTNESS OF URANUS AND JUPITER'S SATELLITES.—On the evening of June 5, 1872, M. Prosper Henry, at the Observatory of Paris, took advantage of the very close approach of Uranus to Jupiter (difference of declination only 1′·2 at conjunction) to compare the light of the satellites of Jupiter with the former planet. He found the brightness of Uranus was equal to that of the third satellite, which was nearest to Uranus at the moment. If there existed any difference of light between the two others, it was to the advantage of Uranus, but in any case it was very small. The observations were made with the large Foucault telescope. So favourable an opportunity of making these comparisons may not occur again for a very long period.

BLANPAIN'S COMET, 1819.—A new reduction of the observations of this remarkable comet, taken at Paris, of which we have the particulars in detail, and recalculation of the elements thereupon, appears to lead to a somewhat longer period than was inferred by Encke, from the same observations as at first reduced. This somewhat longer period—a little over five years—would occasion a near approach of the comet to the planet Jupiter at the previous aphelion passage, and it is easy to see that the observations would allow of so close a proximity at this

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[1] "Cutting out" is drafting a beast out of a mob, following it through all its wild rushes, twistings, and turnings, through perhaps many hundreds of cattle, never leaving it till it is fairly drafted out. This work often taxes the skill and energy of stockman and his horse pretty severely.

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point of the orbit that a very material change of elements may have been then occasioned, perhaps sufficiently great to account for the difference of the elements from those of the first comet of 1743, which Clausen conjectured to be identical with Blanpain's.

PROF. HUXLEY ON UNIVERSITY EDUCATION[1]

THE actual work of the University founded in this city by the well-considered munificence of Johns Hopkins commences to-morrow, and among the many marks of confidence and good-will which have been bestowed upon me in the United States, there is none which I value more highly than that conferred by the authorities of the University when they invited me to deliver an address on such an occasion.

For the event which has brought us together is, in many respects, unique. A vast property is handed over to an administrative body, hampered by no conditions save these :—That the principal shall not be employed in building ; that the funds shall be appropriated in equal proportions to the promotion of natural knowledge, and to the alleviation of the bodily sufferings of mankind ; and, finally, that neither political nor ecclesiastical sectarianism shall be permitted to disturb the impartial distribution of the testator's benefactions.

In my experience of life a truth which sounds very much like a paradox has often asserted itself, viz., that a man's worst difficulties begin when he is able to do as he likes. So long as a man is struggling with obstacles he has an excuse for failure or shortcoming ; but when fortune removes them all and gives him the power of doing as he thinks best, then comes the time of trial. There is but one right, and the possibilities of wrong are infinite. I doubt not that the trustees of the Johns Hopkins University felt the full force of this truth when they entered on the administration of their trust a year and a half ago ; and I can but admire the activity and resolution which have enabled them, aided by the able president whom they have selected, to lay down the great outlines of their plan, and carry it thus far into execution. It is impossible to study that plan without perceiving that great care, forethought, and sagacity, have been bestowed upon it, and that it demands the most respectful consideration. I have been endeavouring to ascertain how far the principles which underlie it are in accordance with those which have been established in my own mind by much and long-continued thought upon educational questions. Permit me to place before you the result of my reflections.

Under one aspect, a university is a particular kind of educational institution, and the views which we may take of the proper nature of a university are corollaries from those which we hold respecting education in general. I think it must be admitted that the school should prepare for the university, and that the university should crown the edifice, the foundations of which are laid in the school. University education should not be something distinct from elementary education, but should be the natural outgrowth and development of the latter. Now I have a very clear conviction as to what elementary education ought to be ; what it really may be when properly organised, and what I think it will be before many years have passed over our heads in England and in America. Such education should enable an average boy of fifteen or sixteen to read and write his own language with ease and accuracy, and with a sense of literary excellence derived from the study of our classic writers ; to have a general acquaintance with the history of his own country and with the great laws of social existence ; to have acquired the rudiments of the physical and psychological sciences, and a fair knowledge of elementary arithmetic and geometry. He should have obtained an acquaintance with logic rather by example than by precept, while the acquirement of the elements of music and drawing should have been pleasure rather than work.

It may sound strange to many ears if I venture to maintain the proposition that a young person, educated thus far, has had a liberal, though perhaps not a full education. But it seems to me that such training as that to which I have referred may be termed liberal in both the senses in which that word is employed with perfect accuracy. In the first place, it is liberal in breadth. It extends over the whole ground of things to be known and of faculties to be trained, and it gives equal importance to the two great sides of human activity—art and science. In the second place, it is liberal in the sense of being an education fitted for free men ; for men to whom every career is open, and from whom their country may demand that they should be fitted to perform the duties of any career. I cannot too strongly impress upon you the fact that with such a primary education as this, and with no more than is to be obtained by building strictly upon its lines, a man of ability may become a great writer or speaker, a statesman, a lawyer, a man of science, painter, sculptor, architect, or musician. That even development of all a man's faculties, which is what properly constitutes culture, may be effected by such an education, while it opens the way for the indefinite strengthening of any special capabilities with which he may be gifted.

In a country like this, where most men have to carve out their own fortunes and devote themselves early to the practical affairs of life, comparatively few can hope to pursue their studies up to or beyond the age of manhood. But it is of vital importance to the welfare of the community that those who are relieved from the need of making a livelihood, and still more, those who are stirred by the divine impulses of intellectual thirst or artistic genius, should be enabled to devote themselves to the higher service of their kind as centres of intelligence, interpreters of nature, or creators of new forms of beauty. And it is the function of a university to furnish such men with the means of becoming that which it is their privilege and duty to be. To this end the university need cover no ground foreign to that occupied by the elementary school. Indeed, it cannot ; for the elementary instruction which I have referred to embraces all the kinds of real knowledge and mental activity possible to man. The university can add no new departments of knowledge, can offer no new fields of mental activity ; but what it can do is to intensify and specialise the instruction in each department. Thus literature and philology, represented in the elementary school by English alone, in the university will extend over the ancient and modern languages. History, which like charity best begins at home, but, like charity, should not end there, will ramify into archæology, political history and geography, with the history of the growth of the human mind and its products in the shape of philosophy, science, and art. And the university will present to the student libraries, museums of antiquities, collections of coins, and the like which will efficiently subserve these studies. Instruction in the elements of social economy, a most essential, but hitherto sadly-neglected part of elementary education, will develop in the university into political economy, sociology, and law. Physical science will have its great divisions of physical geography, with geology and astronomy ; physics, chemistry and biology, represented not merely by professors and their lectures, but by laboratories, in which the students, under guidance of demonstrators, will work out facts for themselves and come into that direct contact with reality which constitutes the fundamental distinction of scientific education. Mathematics will soar into its

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[1] Address (revised by the Author) delivered at the formal opening of the Johns Hopkins University at Baltimore, U.S., September 12. The total amount bequeathed by Johns Hopkins is more than 7,000,000 dollars. The sum of 3,500,000 dollars is appropriated to a university, a like sum to a hospital, and the rest to local institutions of education and charity.

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